

### CLAIMS

1. A system for automatically obtaining the connectivity status, or map, of a cabling system in data and/or voice networks, which includes patch panels, each of which contains sockets, which sockets are data and/or voice ports to which one or more patch cords are connected, and for managing said cabling system by means of the obtained connectivity status, or map, said system comprising patch panels of the existing cabling system and a retrofit kit, said retrofit kit comprising:
  - a) a plurality of upgraded patch cords for replacement of respective used patch cords, each of said upgraded patch cords including one or more internal scanning wires and one or more electrical scanning contacts in electrical contact with the corresponding internal scanning wires, one or more scanning paths being formed in each of the upgraded patch cords by means of said internal scanning wires and one or more scanning contacts for allowing scanning signals to be forwarded by a scanning system;
  - b) a plurality of adapter panels for facilitating cabling system management, each of said adapter panels being attached to a respective patch panel and including, for any given socket in the respective patch panel, a connectivity status indicator and one or more electrical contacts, each of said electrical contacts being intended to mate with a corresponding electrical scanning contact of an upgraded patch cord, said scanning signals being forwarded to said electrical contacts from said scanning system or being forwarded to said scanning system from a respective scanning path, whereby a scanning signal received by one or more electrical contacts is processed to generate data that represents the current connectivity status, or map, of the cabling system; and
  - c) a plurality of adapter plugs for initializing the scanning system with a first connectivity status, or map, one of said adapter plugs being connected to each end of a used patch cord and to an adapter panel, each of said adapter plugs comprising an adaptation socket, an adaptation plug, and one or more external

electrical contacts connected to corresponding conductors associated with a used patch cord to which the adapter plug is attached;

wherein determination of which patch cords are to be replaced by respective upgraded patch cords and, following completion of the replacement, management of said cabling system, are effected in conjunction with said first connectivity status, or map.

2. A system according to claim 1, wherein scanning paths during initialization of the scanning system, by which scanning signals are forwarded, comprises wires included in the patch cords, said one or more conductors associated with a used patch cord, the corresponding external electrical contacts of a pair of adapter plugs, internal electrical contacts of the corresponding adapter plugs, and the corresponding electrical contacts of the adapter panel.

3. A system according to claim 1, wherein whenever a connectivity change is required in upgraded patch cords used by the cabling system, the scanning system forwards to the respective connectivity status indicators indication signals, said signals being guiding signals that indicate from, or to, which socket(s) a used upgraded patch cord should be disconnected, or connected, respectively, and, whenever a new upgraded patch cord should be added to the cabling system, guiding signals that indicate to which sockets the new upgraded patch cord should be connected.

4. A system according to claim 1, wherein whenever the scanning system identifies erroneous connections, or disconnections, said scanning system forwards to the respective connectivity status indicators indication signals, said signals being error signals, for indicating the erroneous sockets associated with said connections or disconnections.

5. A system according to claim 1, wherein the adapter panel includes a Printed Circuit Board (PCB), on which the electrical contacts and the connectivity status indicators are installed, and the PCB is connected to the scanning system via a flat cable, which allows said scanning system to transmit and forward scanning signals and guiding/error signals, respectively.
6. A system according to claim 1, wherein the connectivity status indicator is a Light Emitting Diode (LED).
7. A system according to claim 1, wherein one or more electrical scanning contacts are externally and/or internally integrated to the upgraded plug.
8. A system according to claim 1, wherein at least one electrical contact is a spring contact, or rigid contact, and at least one electrical scanning contact is rigid contact or flexible, respectively, for ensuring electrical continuity between the electrical contact and the electrical scanning contact.
9. A method for automatically obtaining the connectivity status, or map, of a cabling system in data, or voice, networks, which includes patch panels, each of which containing sockets, said sockets being data or voice ports, to which one or more patch cords are connected, and for utilizing the obtained connectivity status, or map, for managing said cabling system, comprising:
- a) Providing a plurality of adapter panels, and attaching each one of said adapter panels to a respective patch panel, each one of said adapter panels including, for any given socket in the respective patch panel, one or more electrical contacts and a connectivity status indicator;
  - b) Providing a plurality of adapter plugs for temporarily utilizing (used) patch cords for generating a first (initial) connectivity status;
  - c) Disconnecting said adapter plugs and said used patch cords from the cabling system;

- d) Forwarding guiding signals to the respective connectivity status indicators, according to said initial connectivity status, for indicating which upgraded patch cord(s) is(are) to be connected;
- e) Emitting scanning signals from a scanning system to a first set of electrical contacts, according to a predetermined schedule, and forwarding said scanning signals to respective scanning paths;
- f) Receiving said scanning signals from said respective scanning paths by a second set of electrical contacts, and forwarding the received scanning signals to said scanning system, thereby completing transmission of said scanning signals;
- g) Processing, by said scanning system, said received scanning signals, the processing including identifying the first and second ends of each one of the upgraded patch cords, generating and storing first data that represents the current connectivity status, or map, of the cabling system; and
- h) Continuously, or whenever required, repeating steps e) to g).

10. A method according to claim 9, wherein one or more electrical contacts mate with respective electrical scanning contacts, whereby corresponding scanning signals are allowed to be transmitted or received via the respective electrical scanning contact.

11. A method according to claim 9, wherein a connectivity status indicator indicates changes that are required in the connectivity status, and/or erroneous connections or disconnections, by forwarding, by the scanning system, corresponding guiding and/or error signals.

12. A method according to claim 9, wherein a database for management of the cabling system after the replacement of the used patch cords by the upgraded patch cords is generated by performing the following steps:

- a) Mating an adapter plug to each end of a used patch cord and to an adapter panel;

- b) Utilizing, in each one of said used patch cords, a data wire as a scanning wire, which is electrically connected, via the corresponding internal contacts, to the corresponding external scanning contacts, for allowing transmitting or receiving scanning signals, via a respective scanning path, which comprises the scanning wire, two corresponding internal contacts and external contacts of the respective adapter plug;
- c) Emitting scanning signals from said scanning system to a third set of respective electrical contacts, according to a predetermined schedule, said scanning signals being forwarded from said third set of electrical contacts to the respective scanning paths;
- d) Receiving said scanning signals from said scanning paths by a fourth set of respective electrical contacts, and forwarding the received scanning signals to said scanning system; and
- e) Processing, by said scanning system, the received scanning signals, the processing including identifying the first and second ends of each one of the connected (used) patch cords, and generating and storing initial data that represents the current initial connectivity status, or map, of said cabling system.

13. A method according to claim 9, wherein the guiding signals are used for replacing some, or all, of the used patch cords by corresponding upgraded patch cords, each upgraded patch cord including an internal scanning wire, each end of which being in electrical contact with a respective electrical scanning contact of a respective upgraded plug, an upgraded plug being connected to the respective end of said upgraded patch cord, said internal scanning wire and two corresponding electrical scanning contacts forming a scanning path, via which scanning signals are forwarded by said scanning system.

14. A method according to claim 9, wherein steps e) to g) are employed automatically or manually, and according to a chosen schedule.

15. A method according to claim 9, wherein managing of the cabling system includes identifying erroneous connections, or disconnections in the connectivity status, comprising:

- a) Comparing first stored data with second stored data representing wanted connectivity status, for allowing identification of unwanted changes in said connectivity status, said wanted connectivity status is obtained by connecting upgraded patch cords to corresponding sockets, employing the scanning system and indicating to the scanning system that the scanning results represent the wanted connectivity status, or, alternatively, the wanted connectivity status may be represented by a corresponding data that is pre-stored in a corresponding storage array; and
- b) Whenever an unwanted change(s) in the connectivity status is(are) identified, sending corresponding error signal(s) to the respective connectivity status indicators.

16. A method according to claim 9, wherein managing of the cabling system includes guiding a person through wanted changes in the connectivity status, comprising utilizing pre-stored data, which represent the wanted new connectivity status, for causing the scanning system to forward guiding signals, according to wanted order, to the respective connectivity status indicators (CSIs), said wanted order is predetermined by a person, who makes the physical changes in said connectivity status, or by the scanning system.

17. A method according to claim 16, wherein the next scheduled CSI, which is to be activated according to the wanted order, and which is related to the next scheduled change, is activated only after the wanted current connectivity change is successfully completed.

18. A method according to claim 17, wherein in order to determine whether a wanted connectivity change is successfully completed, the scanning system transmits scanning signals and checks, by employing comparison process,

whether the actual current change matches the expected/scheduled current change, after which said scanning system forwards, in the event of mismatch, corresponding error signal(s), or, otherwise, the next scheduled connectivity status indicator is activated by said scanning system.

19. A method according to claim 10, wherein the electrical scanning contact is external, or internal, or both.

20. A method according to claim 9, wherein the electrical contact is a spring contact, or rigid contact, and the electrical scanning contact is rigid contact or flexible, respectively, for ensuring electrical continuity between the electrical contact and the electrical scanning contact.